

**Amendments to the Claims:**

Please amend claims 1, 2, 4, 6-13, 16, 17, 19, 20 and 22 as indicated below.

Please cancel claims 3, 5, 21 and 23-25.

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended): An interference microscope, comprising:

- a first and a second objective respectively disposed on opposite sides of a specimen;
- at least one a specimen support unit, the specimen support unit including first and second cover glasses configured to hold the specimen therebetween;
- ~~a specimen being provided and associated with the specimen support unit and,~~
- at least one coating disposed on at least one planar area is provided for determination of an illumination state in the specimen in the interference microscope wherein the at least one planar area is a surface on the specimen support unit and is configured to be detectable by light microscopy surface of the first cover glass facing the specimen;  
and
- at least one detector configured to detect light reflected or induced at the coating so as to measure an intensity signal profile as a function of an axial position of the at least one coating.

Claim 2 (currently amended): The interference microscope as defined in Claim 1 wherein the microscope ~~consists of~~ includes at least one of a 4 $\pi$  microscope, a standing wave field microscope, a I<sup>2</sup>M, I<sup>3</sup>M, or I<sup>5</sup>M an Image Interference Microscopy microscope, an Incoherent Interference Illumination Microscopy microscope, and a combination Image Interference Microscopy and Incoherent Interference Illumination Microscopy microscope.

Claim 3 (canceled)

Claim 4 (currently amended): The interference microscope as defined in Claim 1, wherein the ~~planar area,~~ coating is embodied in at least partially reflective fashion.

Claim 5 (canceled)

Claim 6 (currently amended): The interference microscope as defined in Claim ~~[[5]]~~ 4, wherein the ~~surface~~ coating has a defined reflectance that ~~preferably~~ is constant.

Claim 7 (currently amended): The interference microscope as defined in Claim ~~[[5]]~~ 4, wherein the coating ~~of the surface~~ is configured in wavelength-dependent fashion so that light of at least one wavelength can be reflected.

Claim 8 (currently amended): The interference microscope as defined in Claim ~~[[5]]~~ 4, wherein a metallic or dielectric coating is provided.

Claim 9 (currently amended): The interference microscope as defined in Claim ~~[[5]]~~ 4, wherein a dielectric or metallic/dielectric hybrid coating is provided.

Claim 10 (currently amended): The interference microscope as defined in Claim 1, wherein ~~the~~ at least one surface coating of the specimen support unit comprises at least one layer that can be excited to ~~luminesce, in particular to~~ fluoresce.

Claim 11 (currently amended): The interference microscope as defined in Claim 10, wherein the surface coating comprises ~~several~~ a plurality of luminescent layers differing in their luminescent properties.

Claim 12 (currently amended): The interference microscope as defined in Claim ~~10~~ 11, wherein at least one of the plurality of luminescent layer layers can be excited to luminesce with light of a light source.

Claim 13 (currently amended): The interference microscope as defined in Claim 1, wherein the at least one coating is configured to have light is induced at a planar area of the specimen support unit therein by way of a nonlinear processes process.

Claim 14 (original): The interference microscope as defined in Claim 13, wherein the nonlinear process is coherent anti-Stokes Raman scattering (CARS).

Claim 15 (canceled)

Claim 16 (currently amended): The interference microscope as defined in Claim ~~[[3]]~~ 1, wherein the light reflected or induced at the ~~planar-area~~ coating can be detected with an additional detector.

Claim 17 (currently amended): The interference microscope as defined in Claim 16, wherein the light reflected or induced at the ~~planar-area~~ coating is, by means of an optical component, switched out of ~~the~~ a detected or illuminating beam path of the interference microscope and conveyed to an additional detector.

Claim 18 (original): The interference microscope as defined in Claim 17, wherein a glass plate, a dichroic beam splitter, a filter, a prism, a grating, or a spectrally sensitive arrangement is provided as the optical component.

Claim 19 (currently amended): The interference microscope as defined in Claims ~~[[15]]~~ 1, wherein a pinhole is arranged in front of the detector.

Claim 20 (currently amended): The interference microscope as defined in Claim 19, wherein the pinhole is arranged in a plane corresponding to ~~the~~ a specimen plane of an objective of the first and second objectives.

Claim 21 (canceled)

Claim 22 (currently amended): The interference microscope as defined in Claim 1, wherein at least one ~~additional~~ light source is provided as a laser for determining ~~the illumination state~~ an intensity profile in a specimen region of the interference microscope.

Claims 23-25 (canceled)

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Claims 26-38 (withdrawn)